

REMARKS

In the Office Action mailed May 11, 2005, the Examiner withdrew the previous rejections and reopened prosecution. The Examiner rejected claims 1, 2, 5, 11, 13, and 17-20 under 35 USC §102(b) as being anticipated by US 5,388,048 to Yavnayi et al. The Examiner rejected claims 6, 12, and 14 under 35 USC §103(a) as being unpatentable over Yavnayi et al. in view of US Publication 2003/0222772 to Laufer. The Examiner rejected claims 15 and 16 under 35 USC §103(a) as being unpatentable over Yavnayi et al. In view of JP 05297141 to Azusazawa et al.

As indicated by the included Claim Listing, Applicant has cancelled claims 12 and 14 and previously cancelled claims 3-4 and 7-10. Applicant has added new claims 21-26. Claims 1-2, 5-6, and 11, 13, and 14-26 are currently pending in this application.

Reconsideration and re-examination of the application as amended is respectfully requested.

Rejection Under 35 USC §102(b)

The Examiner rejected claims 1, 2, 5, 11, 13, and 17-20 under 35 USC §102(b) as being anticipated by US 5,388,048. Applicants respectfully disagree and traverse the Examiner's rejection.

As described in the specification and recited in independent claims 1, 11, 13, and 18-20, Applicants' invention includes systems and methods for detecting an object that emit one or more light pulses, receive a reflection of the emitted pulse(es) and adjust sensitivity based on the elapsed time after emission or elapsed time between emission of the pulse(es) and receiving of the reflection(s). By adjusting the sensitivity as disclosed and claimed, Applicants' invention can detect objects at relatively large distances while also detecting objects through fog. As with the previously applied reference (US 5,485,155 to Hibino), US5,388,048 to Yavnayi et al. does not disclose or suggest adjusting sensitivity based on elapsed time from said emission as disclosed and claimed by Applicants. Furthermore, as described in greater detail herein, Yavnayi '048 does not disclose or suggest multiplying the received signal by a gain that increases based on elapsed time from emission as disclosed and claimed by Applicants.

Yavnayi '048 does not adjust sensitivity based on elapsed time from emission as disclosed and claimed by Applicants. In contrast, Yavnayi '048 uses elapsed time between receipt of subsequent pulses to calculate the self-speed of the vehicle and the collision time between two vehicles (Col. 5, l. 49 – Col 6, l.24). This is clearly different than adjusting sensitivity based on elapsed time from emission as claimed by Applicants and would not solve the problem of detecting relatively distant objects in addition to close objects while having acceptable performance in the presence of adverse environmental conditions including fog or dust, for example.

The Examiner is apparently relying on Col. 4, ll. 20-46 and Col. 7, ll. 7-41 of Yavnayi '048 as disclosing a sensitivity adjustment that anticipates Applicants' claimed invention. While Yavnayi illustrates a sensitivity selector that may be used to adjust sensitivity of the system for fog, the sensitivity selector (24) in Figure 1 is implemented by a switch (69) in combination with two resistors (67, 67') as shown and described in reference to Figure 6 (See Col. 1, ll.26-29 and Col. 7, ll.35-41). Yavnayi '048 describes operation of this sensitivity selector as:

"Thus, by selecting suitable values for the first and second resistors 67 and 67', respectively, the sensitivity of the rangefinder receiver may be increased or decreased. This is particularly useful for increasing the sensitivity of the device in adverse weather conditions, such as fog, when visibility is low so that detection of weak reflections over small distances may be effected." (Col 7, ll.35-41).

This is clearly different from Applicants' claimed invention, which adjusts sensitivity based on elapsed time from emission. There is no disclosure in the Yavnayi '048 reference of how or who determines when to adjust the sensitivity by selecting resistor 67 or 67'.

Yavnayi '048 teaches away from Applicants' invention by stating that "This is particularly useful for increasing the sensitivity of the device in adverse weather conditions, such as fog, when visibility is low so that detection of weak reflections over small distances may be effected." As such, Yavnayi '048 teaches increased sensitivity for fog. This is precisely the problem of various prior art systems described by Applicant in the Background section of the specification and solved by Applicants' claimed invention. The problem as described by Applicants':

"For example, in foggy road conditions, a large portion of transmitted light from a light transmitter would be reflected back toward a light detector proximate the transmitter. The amplitude of the signal generated by the light detector would be relatively high and could be greater than a constant threshold value (used for detecting objects at large distances from the vehicle). Thus, when the signal is greater than the constant threshold value due to fog, the known system would inadvertently indicate a solid object was detected.

* * *

Thus, because the known system does not vary its detection sensitivity based on a distance (or elapsed travel time) of the light pulse, the system would be unable to detect objects at relatively large distances. Further, the known system would also falsely indicate detection of an object in fog conditions." (Applicant's Specification pp. 1-2)

This problem would be exacerbated, not solved, by a further increase in sensitivity in foggy conditions as taught by Yavnayi et al. '048.

While Yavnayi et al. '048 do teach a decreasing threshold or reference voltage generated by the RC circuit illustrated and described with reference to Figure 6, the circuit is based (reset) on receipt of subsequent pulses and not based on elapsed time of emission as disclosed and claimed by Applicants'. Furthermore, the circuit uses elapsed time between subsequent pulses to determine the distance or range of adjacent vehicles and not to adjust sensitivity of the system as disclosed and claimed by Applicants'. The only sensitivity adjustment is based on an undisclosed system/method for selection one of the (fixed) value resistors 67 and 67'.

In summary, Yavnayi et al. does not disclose or suggest use of elapsed time from emission for anything. The elapsed time between receipt of subsequent pulses disclosed by Yavnayi et al. is used to determine distance between adjacent vehicles, not to adjust sensitivity of the system. The sensitivity adjustment of Yavnayi et al. is a switch to select between two fixed values and does not vary based on any elapsed time.

For the reasons stated above, Applicants respectfully submit that Yavnayi et al. '048 fails to anticipate Applicants' claims and requests the Examiner to withdraw the rejection under §102.

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 6, 12, and 14 under 35 USC §103(a) as being unpatentable over the primary reference to Yavnayi et al. in view of US 2003/0222772 to Laufer, and JP 05297141 to Azusazawa et al. Applicants respectfully disagree and traverse the Examiner's rejections.

As stated above and incorporated here by reference, the primary reference fails to disclose adjusting sensitivity based on elapsed time from emission as disclosed and claimed by Applicants. Because the Examiner relies on the primary reference in each of the obviousness rejections, and the secondary references of Laufer and Azusazawa et al. also fail to disclose or suggest this feature, the proposed combinations fail to teach or suggest all the features of Applicant's claimed invention and the rejection should be withdrawn.

As described in detail above, the primary reference to Yavnayi et al. fails to recognize the problems of detecting objects through fog or similar environmental conditions that would produce a relatively large amplitude reflected signal and teaches increasing sensitivity using a switch selector rather than increasing sensitivity based on elapsed time from emission. As such, there would be no motivation for one of ordinary skill in the art to modify the system of Yavnayi et al. to adjust sensitivity based on elapsed time as disclosed and claimed by Applicants and no motivation to combine such modified teachings with those of Laufer or Azusazawa.

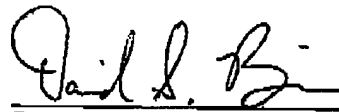
While Applicants have cancelled claims 12 and 14 to add additional claims without cost, Applicants respectfully submit that the invention as claimed in these claims in addition to claim 6 is patentable over the prior art applied by the Examiner and the rejections under 35 USC §103 should be withdrawn.

Summary

Applicants have made a genuine effort to respond to each of the Examiner's rejections and objections to advance the prosecution of this case. Applicants respectfully submit that all formal and substantive requirements for patentability have been met and that this case is in condition for allowance, which action is respectfully requested. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

No additional fee is believed to be due based on the filing of this response. However, please charge or credit any fee deemed necessary for the filing of this Amendment to Deposit Account 06-1510 (Ford Global Technologies, LLC). If there are insufficient funds in this account, please charge the fees to Deposit Account No.06-1505.

Respectfully submitted,



David S. Bir
Registration No. 38,383
Filed Under Rule 34(a)

Date: August 3, 2005

Bir Law, PLC
45094 Middlebury Ct.
Canton, MI 48188-3215
734-981-5646
Fax: (734)468-4257